Search Results - Record(s) 1 through 9 of 9 returned.

☐ 1. Document ID: US 5990440 A

L5: Entry 1 of 9 File: USPT Nov 23, 1999

US-PAT-NO: 5990440
DOCUMENT-IDENTIFIER: US 5990440 A

TITLE: Switch and arc extinguishing material for use therein

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yamaguchi; Shoji	Amagasaki			JPX
Nishiyama; Itsuo	Amagasaki			JPX
Baba; Fumiaki	Amagasaki			JPX
Takahasi; Mitugu	Amagasaki			JPX
Mitsuhashi; Takao	Amagasaki			JPX
Kato; Kazuharu	Amagasaki			JPX
Hiroi; Osamu	Amagasaki			JPX
Murakami; Tadaki	Amagasaki			JPX
Adachi; Hiroshi	Amagasaki			JPX
Nishina; Kenichi	Fukuyama			JPX
Fukuya; Kazunori	Fukuyama			JPX
Yamagata; Shinji	Fukuyama			JPX
Katsube; Shunichi	Fukuyama			JPX

US-CL-CURRENT: 218/158; 218/34

ABSTRACT:

A switch containing a switch case, contacts adapted to be opened and closed, an arc extinguishing chamber disposed in the vicinity of the contacts, and an arc extinguishing material capable of reducing the amount of metal particles and free carbons to be scattered from components disposed within the switch by an arc generated when the contacts are opened or closed or capable of insulating the metal particles and the free carbons to convert into an insulator, thereby inhibiting a decrease in arc resistance expected to occur upon the generation and extinction of the arc and a decrease in insulation resistance expected to occur within and around the arc extinguishing chamber and at inner wall surfaces of the switch case upon and after the extinction of the arc. The switch is applicable to a switch expected to generate an arc upon interruption of electric current flowing therethrough such as a circuit breaker, current-limiting device or electromagnetic contactor and is capable of immediately extinguishing the arc and inhibiting the decrease in insulation resistance within and around the arc extinguishing chamber and at inner wall surfaces of the switch case.

9 Claims, 32 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 22

☐ 2. Document ID: US 5965655 A

L5: Entry 2 of 9 File: USPT Oct 12, 1999

US-PAT-NO: 5965655
DOCUMENT-IDENTIFIER: US 5965655 A

TITLE: Mineral filled moldable thermoplastic composition

DATE-ISSUED: October 12, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mordecai; Woodie D.	Mt. Vernon	IN		
Yates; John B.	Glenmont	NY		
Liu; Nan-I	Taipei			TWX

US-CL-CURRENT: 524/456; 524/413, 524/423, 524/442, 524/449

ABSTRACT:

This invention is directed to an improved thermoplastic molding composition having an admixture of thermoplastic polymer or blends thereof and a particular mineral additive having needle like particles and a high aspect ratio of length to diameter. The composition when molded with the final article has improved surface characteristics, even a Class A surface, a lower coefficient of thermal expansion, as well as other improved properties, particularly impact as determined by Dynatup testing. The mineral additive can range from 5 to 70 weight percent. The polymer portion can be a copolyetherimide ester, a copolyether ester, an aromatic polycarbonate, a rubber modified homopolymer, or copolymer of a vinyl aromatic monomer, a polyphenylene ether, a polyamide, and blends thereof or blends with other polymers. The preferred mineral additive is calcium meta silicate, also known as wollastonite.

6 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw Desc | Image

☐ 3. Document ID: US 5841088 A

L5: Entry 3 of 9 File: USPT Nov 24, 1998

US-PAT-NO: 5841088
DOCUMENT-IDENTIFIER: US 5841088 A

TITLE: Switch and arc extinguishing material for use therein

DATE-ISSUED: November 24, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yamaguchi; Shoji	Amagasaki			JPX
Nishiyama; Itsuo	Amagasaki			JPX
Baba; Fumiaki	Amagasaki			JPX
Takahasi; Mitugu	Amagasaki			JPX
Mitsuhashi; Takao	Amagasaki			JPX
Kato; Kazuharu	Amagasaki			JPX
Hiroi; Osamu	Amagasaki			JPX
Murakami; Tadaki	Amagasaki			JPX
Adachi; Hiroshi	Amagasaki			JPX
Nishina; Kenichi	Fukuyama			JPX
Fukuya; Kazunori	Fukuyama			JPX
Yamagata; Shinji	Fukuyama			JPX
Katsube; Shunichi	Fukuyama			JPX

US-CL-CURRENT: 218/158

ABSTRACT:

A switch comprising a switch case, contacts adapted to be opened and closed, an arc extinguishing chamber disposed in the vicinity of the contacts, and an arc extinguishing material capable of reducing the amount of metal particles and free carbons to be scattered from components disposed within the switch by an arc generated when the contacts are opened or closed or capable of insulating the metal particles and the free carbons to convert into an insulator, thereby inhibiting a decrease in arc resistance expected to occur upon the generation and extinction of the arc and a decrease in insulation resistance expected to occur within and around the arc extinguishing chamber and at inner wall surfaces of the switch case upon and after the extinction of the arc. The switch according to the present invention is applicable to a switch expected to generate an arc upon interruption of electric current flowing therethrough such as a circuit breaker, current-limiting device or electromagnetic contactor and is capable of immediately extinguishing the arc and inhibiting the decrease in insulation resistance within and around the arc extinguishing chamber and at inner wall surfaces of the switch case.

43 Claims, 32 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 22

☐ 4. Document ID: US 4943603 A

L5: Entry 4 of 9 File: USPT Jul 24, 1990

US-PAT-NO: 4943603
DOCUMENT-IDENTIFIER: US 4943603 A

TITLE: Reinforced polymer compositions having excellent distinctness of image

DATE-ISSUED: July 24, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Martinez; Eloy C.	Lake Jackson	TX		

US-CL-CURRENT: 523/220; 524/451, 524/456, 524/589, 524/590

ABSTRACT:

Molded polyurethanes are filled with a particular filler mixture, including a certain wollastonite or talc as a supplementary filler, to provide a polymer composition having surprising good physical properties and excellent surface quality.

12 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw. Desc | Image

☐ 5. Document ID: US 4888127 A

L5: Entry 5 of 9 File: USPT Dec 19, 1989

US-PAT-NO: 4888127
DOCUMENT-IDENTIFIER: US 4888127 A

TITLE: Liquid crystal polyester resin composition having excellent surface characteristics

DATE-ISSUED: December 19, 1989

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wada; Mitsuo	Fuji			JPX
Kanoe; Toshio	Fuji			JPX
Ishikawa; Takayuki	Shimizu			JPX

US-CL-CURRENT: 252/299.5; 252/299.01, 523/220, 523/513, 524/847

ABSTRACT:

A liquid crystal polyester composition having an improved resistance to deformation comprising 99.5 to 30 percent by weight of a polyester which is melt-processable and capable of forming an anisotropic phase in the melt state and 0.5 to 7 percent by weight of filler particles.

28 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw. Desc | Image

☐ 6. Document ID: US 4871789 A

L5: Entry 6 of 9 File: USPT Oct 3, 1989

US-PAT-NO: 4871789
DOCUMENT-IDENTIFIER: US 4871789 A

TITLE: Reinforced polymer compositions having excellent distinctness of image

DATE-ISSUED: October 3, 1989

INVENTOR-INFORMATION:

NAME	CITY	STATE	CODE	COUNTRY
Martinez; Eloy C.	Lake Jackson	TX		

US-CL-CURRENT: 523/220; 524/456, 524/589, 524/590

ABSTRACT:

Molded polyurethanes are filled with a particular filler mixture, including a certain wollastonite or talc as a supplementary filler, to provide a polymer composition having surprising good physical properites and excellent surface quality.

15 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw. Desc | Image

☐ 7. Document ID: AU 200066186 A, WO 200109246 A1, JP 2001106904 A

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw. Desc | Image

☐ 8. Document ID: AU 200065117 A, WO 200109233 A1, JP 2001106908 A

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw. Desc | Image

☐ 9. Document ID: DE 3344769 A, CA 1229956 A, DE 3344769 C, GB 2133427 A, GB 2133427 B, JP 59135141 A, US 4613627 A

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw. Desc | Image

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Term	Documents
POLYAMIDE.DWPI,EPAB,JPAB,USPT.	167587
POLYAMIDES.DWPI,EPAB,JPAB,USPT.	61372
NYLON.DWPI,EPAB,JPAB,USPT.	179325
NYLONS.DWPI,EPAB,JPAB,USPT.	7853
(4 AND (NYLON OR POLYAMIDE)).USPT,JPAB,EPAB,DWPI.	9
(L4 AND (POLYAMIDE OR NYLON)).USPT,JPAB,EPAB,DWPI.	9

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DOCUMENT-IDENTIFIER: US 5965655 A
TITLE: Mineral filled moldable thermoplastic composition

Abstract Paragraph Left (1):
This invention is directed to an improved thermoplastic molding composition having an admixture of thermoplastic polymer or blends thereof and a particular mineral additive having needle like particles and a high aspect ratio of length to diameter. The composition when molded with the final article has improved surface characteristics, even a Class A surface, a lower coefficient of thermal expansion, as well as other improved properties, particularly impact as determined by Dynatup testing. The mineral additive can range from 5 to 70 weight percent. The polymer portion can be a copolyetherimide ester, a copolyether ester, an aromatic polycarbonate, a rubber modified homopolymer, or copolymer of a vinyl aromatic monomer, a polyphenylene ether, a polyamide, and blends thereof or blends with other polymers. The preferred mineral additive is calcium meta silicate, also known as wollastonite.

Brief Summary Paragraph Right (1):
The present invention is directed to an improved moldable thermoplastic composition having in admixture a particular polymer or blends of particular polymers and a particulate mineral additive. The particulate mineral additive of this invention has needle like particles of a relatively small diameter and having a high aspect ratio of length to diameter. A molded article employing the composition of this invention can have a lower coefficient of thermal expansion (CTE) and/or a high distinctness of image (DOI), which results in a molded article that can have a Class A surface, or an improved surface, as well as other improved properties, particularly impact when compared to other mineral additives.

Brief Summary Paragraph Right (11):
In accordance with the present invention, there is provided an improved thermoplastic molding composition having, in the molded state, a lower coefficient of thermal expansion (CTE) and a higher distinctness of image (DOI) comprising in intimate admixture of (1) a thermoplastic polymer which may be either a copolyetherimide ester, a polyalkylene terephthalate, an aromatic polycarbonate, a rubber modified homopolymer or copolymer of a vinyl aromatic monomer, a polyphenylene ether, a polyamide, blends thereof, or blends thereof with other polymers, and (2) a fine needle like particulate mineral additive wherein the needle like particles have a mean number average length of about 1.0 .mu.m to about 50 .mu.m and a mean number average diameter of about 0.1 .mu.m to about 10 .mu.m. The thermoplastic polymer portion of the intimate admixture of this invention is preferable at least about 30 to about 95 weight percent and more particularly at least about 50 to about 95 weight percent. The mineral additive portion of the intimate admixture is preferably about 70 to about 5 weight and more particularly about 50 to about 5 weight percent the weight percents being based on the total weight of the thermoplastic molding composition disclosed herein.

Brief Summary Paragraph Right (49):
The polyamide resins useful in the practice of the present invention are known as nylons, and are characterized by the presence of an amide group (--CONH--). Nylon-6 and nylon 6,6 are the generally preferred polyamides and are available from a variety of commercial sources. The polyamides may be either amorphous or crystalline polyamides.

Brief Summary Paragraph Right (50):
Typical examples of the polyamides or nylons, as these are often called, include for

example polyamides 6, [redacted], 11, 12, 6/3, 6/4, 6/10, and [redacted]2, as well as polyamides resulting from terephthalic acid and/or isophthalic acid and trimethyl hexamethylene diamine, polyamides resulting from adipic acid and meta xylylenediamines, polyamides resulting from adipic acid, and metaxylylenediamines, polyamides resulting from adipic acid, azelaic acid and 2,2-bis-(p-aminocyclohexyl)propane and polyamides resulting from terephthalic acid and 4,4'-diamino-dicyclohexylmethane. Mixtures and/or copolymers of two or more of the foregoing polyamides or prepolymers thereof, respectively, are also within the scope of the present invention. Preferred polyamides are the polyamides 6, 6/6, 11, and 12, most preferably polyamide 6/6.

Brief Summary Paragraph Right (51):
It is also to be understood that the use of the term "polyamides" herein and in the appended claims is intended to include the toughened or super tough polyamides. Super tough polyamides, or super tough nylons, as they are more commonly known, are available commercially, e.g. from E. I. duPont under the tradename Zytel ST, or may be prepared in accordance with a number of U.S. Patents, including, among others, Epstein U.S. Pat. No. 4,174,358; Novak U.S. Pat. No. 4,474,927; Roura U.S. Pat. No. 4,346,194; and Joffrion U.S. Pat. No. 4,251,644, all of which are herein incorporated by reference. These super tough nylons are prepared by blending one or more polyamides with one or more polymeric or copolymeric elastomeric toughening agents. Suitable toughening agents are disclosed in the above-identified U.S. Pat. Nos., as well as in Caywood, Jr. U.S. Pat. No. 3,884,882 and Swiger U.S. Pat. No. 4,147,740 and Gallucci et al., "Preparation and Reactions of Epoxy-Modified Polyethylene", J. APPL. POLY. SCI. V. 27, pp. 425-437 91982) all incorporated herein by reference. Typically, these elastomeric polymers and copolymers may be straight chain or branched, as well as graft polymers and copolymers, including core-shell graft copolymers, and are characterized as having incorporated therein either by copolymerization or by grafting on the preformed polymer, a monomer having functional and/or active or highly polar groupings capable of interacting with or adhering to the polyamide matrix so as to enhance the toughness of the polyamide polymer.

Brief Summary Paragraph Right (52):
As stated previously, the thermoplastic composition of this invention may also comprise blends of the above polymers. An example of such blends may be blends of an aromatic polycarbonate and an ABS in a range of about 30 to about 70 weight percent of polycarbonate and about 70 to about 30 weight percent of ABS based on the weight of the polymers employed. In another system, a blend of the polycarbonate and a polyalkylene terephthalate (polybutylene terephthalate) may also be employed herein. Still another blend that may be employed in the practice of this invention is a blend of a polyphenylene ether and a polyamide. Yet another blend may be that of copolyetherimide ester or a copolyether ester and a polyalkylene terephthalate (PBT), or a blend of a polycarbonate, a polybutylene terephthalate (PBT) and ABS. The above blends are merely some of the typical blends that may be employed in the practice of this invention and other blends will become obvious to those skilled in the art in view of the disclosure herein.

Brief Summary Paragraph Right (54):
The mineral additive employed in the practice of this invention has needle like particles. While any such mineral additive may be employed herein, the particles should have the particle size distribution as disclosed herein. Preferably, the mineral filler consists essentially of calcium meta silicate, which is also referred to as calcium silicate, and more commonly as wollastonite. However, since the mineral is mined, other ingredients may also be present in wollastonite, such as trace amounts of aluminum oxide, magnesium oxide and/or iron oxide. Although wollastonite is identified as calcium meta silicate, there may be some free silicon dioxide present therein as well. The mineral filler of this invention consists essentially of needle like particles having a mean number average length of about 1.0 .mu.m to about 50 .mu.m and and a mean number average diameter of about 0.1 .mu.m to about 10 .mu.m. Preferably, at least 80 percent of the needle like particles of the mineral additive have a length of about 5 .mu.m to about 40 .mu.m, and more specifically at least 50 percent of the needle like particles have a length of about 5 .mu.m to about 25 .mu.m. This results in a number average aspect ratio of length to diameter of up to about 6 and preferably ranging from less than about 1.0 to about 10.

Brief Summary Paragraph Right (55):
The preferred mineral additive employed in the present invention is wollastonite or also known as calcium meta silicate, having the particular particle morphology

disclosed previously. Wollastonites are well known mine s and are used as fillers in thermoplastics. However, the known and previously employed wollastonites have a mean number average length of about 90 .mu.m, and a mean average diameter of about 15 .mu.m or greater. Also, at least 50 percent of the particles have a length ranging from about 15 .mu.m to over 50 .mu.m, with at least 80 percent of the particles ranging from 15 to about 150 .mu.m.

Brief Summary Paragraph Right (56):
It has also been found that when the composition of this invention is injection molded, the mineral additive particles may undergo a breaking or shearing, which may result in a decrease of the aspect ratio. Even though this shearing may occur, the mean average aspect ratio would probably still be within the range of less than about 1 to about 10.

Brief Summary Paragraph Right (57):
The object of this invention is to provide an improved thermoplastic molding composition as described previously having the advantage of providing molded articles having a lower CTE and a high or improved DOI. It has also been found that certain compositions of this invention are ductile compared to previously commonly employed wollastonites, as demonstrated in the Examples. It has further been unexpectedly discovered that the use of the particular wollastonite of this invention may also result in a higher DOI, as compared in previously employed wollastonites or other fillers. For example, as shown in the Examples, the use of the wollastonite of this invention greatly increased the DOI of the molded article over previously known fillers. In addition, the mineral filler herein disclosed also provides greater impact strength as determined by the Dynatup impact test, even though brittle breaks may occur. This is demonstrated in the Examples, wherein higher energy is required to break or pierce the sample, again in comparison to previously known wollastonite. This represents that even though the break may be brittle, greater impact is necessary in order to achieve breakage. The results show that a substantial greater energy is required, both at room temperature and at subzero temperatures. It is surprising that the substantial unexpected property increases that are achieved with the particular mineral additives of this invention. Even when employed in combination with other fillers, which are described hereinafter, dramatic increases in properties can be achieved.

Brief Summary Paragraph Right (58):
The mineral additive of this invention may act as a filler or it may act as a reinforcing agent or it may act as a combination of both. The particular mineral additive may also preferably have a surface treatment on the particles such as with a silane surface treatment such as an alkoxy silane or other type of coupling agent such as a titinate or zirconate for example. However, the critical feature of the present invention is that by employing the particular mineral additive disclosed herein, the results achieved as shown in the Examples are not achieved with previously known fillers such as carbon fibers, mica, talc, glass fibers, and even previously known wollastonites, other than the wollastonite having the particle morphology disclosed in this invention.

Brief Summary Paragraph Right (61):
Also contemplated as part of this invention are blends of mineral additives such as blends of the mineral additive of this invention with other fillers such as mica, talc, carbon black, or other minerals not having the needle like morphology of the mineral additive of this invention Even the blend of minerals produces improvement in such properties as DOI and/or the CTE, i.e. by lowering the CTE. For example, a blend of the polymers of this invention with just mica demonstrates (not with the mineral filler of this invention) that a low DOI is obtained on molded parts. However, when adding wollastonite having the particle morphology disclosed in this invention to a blend of a polymer and mica, the DOI is dramatically improved, and the CTE is lowered. This can also occur with blends of the mineral additive of this invention and other mineral additives. The use of such blends can produce lower CTE and better or improved DOI, as demonstrated in the Examples. The amount of other mineral additive that can be blended with the mineral additive of this invention should be that amount that does not affect the increased properties of CTE, DOI, impact, etc. obtained with the mineral additive of the invention. In effect, one can use a lower cost mineral additive in place of part of the mineral additive of this invention without significantly affecting the increased properties afforded by the instant additive disclosed herein. Preferably, the amount of mineral additive of this invention should be about at least 50 percent by weight of the additive, and, more particularly, about at least 70 percent by weight with the balance being such

other mineral additive t of the needle like particles sclosed herein.

Detailed Description Paragraph Right (4):
The wollastonite of this invention employed in the Examples was NYGLOS wollastonite, having an average mean diameter based on number average of less than about 4.5 .mu.m and an average mean length of about 24 .mu.m. The wollastonite of the prior art employed in the Examples was NYAD G wollastonite, having an average mean diameter based on number average of about 16 .mu.m and an average mean length of about 90 .mu.m. Both wollastonites are from NYCO Company. The morphology of the NYGLOS and NYAD G wollastonites was determined on the raw material, i.e. before compounding with the particular resins and other additives to prepare the formulations set forth in the Tables. The method employed was light microscopy. Photomicrographs were made using transmitted bright field illumination on a Zeiss Photomicroscope interfaced to a Zeiss IBAS image analysis system. From the photomicrographs, particles were measured and number average mean results were obtained as reported above. Particle size distribution was also determined.

Detailed Description Paragraph Right (9):
Several blends were prepared, each of which contained 49 parts by weight poly(2,6-dimethyl-1,4-phenylene ether) which had an intrinsic viscosity of, approximately, 0.45 dl/g as measured in chloroform at 25.degree. C., 0.70 part citric acid monohydrate compatibilizing agent, 10 parts rubber modifier (Kraton, G-1651 Shell Chemical, a styrene-ethylene/butylene-styrene triblock copolymer), 0.30 part Irganox 1076 hindered phenol stabilizer, 0.10 part KI stabilizer, and 10 parts of a specified nylon.

Detailed Description Paragraph Right (11):
An additional 31 parts of a nylon component specified in the table were fed at the downstream addition port.

Detailed Description Paragraph Right (13):
The polyamide component designated as nylon 6,6 was NP-10,000 from Nylon Polymers. The nylon 6 was Nycoa 471 from Nylon Corp. of America.

Detailed Description Paragraph Left (1):
except the filled compositions consisted of a blend of 40 parts of the poly(2,6dimethyl -1,4-phenylene ether), 36 parts of the nylon 6/6, 10 parts of the Kraton G-1651, 0.7 parts of citric acid, and 14 parts of the filler, which is as set forth in Table 5 below with the results of the tests run on the Examples, namely Dynatup Impact, coefficient of thermal expansion (CTE), DOI and tensile elongation. Tensile elongation was determined in accordance with ASTM test procedure D638. The other test procedures are as described in Examples 1-4.

Detailed Description Paragraph Left (2):
The above examples were materials tested for their suitability for painted automotive bodypanels. D means number average diameter of the fibers. L means number average length of the fibers. The compositions comprised 70% by weight polybutylene terephthalate, 20 percent by weight polyetherimide ester resin, and 10 percent by weight reinforcing fiber based on the entire weight of the composition. A DOI value of at least 95% is necessary for a composition to be suitable for the automotive body panels, preferably having a DOI of at least 99%. Examples 40.degree. C.-45.degree. C. are comparative examples. Examples 34-38 exhibit sufficiently high DOI values. DOI is measured after exposure of the composition to 280.degree. F. Preferably the coefficient of thermal expansion is between 3.times.10.sup.-5 inches/inch/.degree.F. and 5.times.10.sup.-5 inches/inch/.degree.F., more preferably between 4.times.10.sup.-5 inches/inch/.degree.F. and 5.times.10.sup.-5 inches/inch/.degree.F.

Detailed Description Paragraph Table (6):
TABLE 6 Examples 34-39 AND 40C-45C EX D L DOI CTE 40C Glass Fiber - A 10 300 70 -- 41C Wollastonite 8 80 80 -- 42C PMF 204C 5 50 80 -- 43C Milled glass 7 110 80 -- 44C Milled glass 4 110 80 -- 45C Milled glass 13 65 90 -- 34 Milled ceramic 3 15 99 -- 35 CaSO.sub.4 2 20 99 -- 36 Poly(calcium 0.5 15 99 5.0 terephthalate) 37 Titanate 1.0 50 99 4.4 38 TiO.sub.2 0.16 1.7 99 6.5 39 Norphil 0.4 1.6 85 --

CLAIMS:

3. The thermoplastic m ing composition of claim 1, wh in said particulate mineral has a number average aspect ratio of length to diameter of up to about 6.

L5: Entry 4 of 9 File: USPT Jul 24, 1990

DOCUMENT-IDENTIFIER: US 4943603 A
TITLE: Reinforced polymer compositions having excellent distinctness of image

Abstract Paragraph Left (1):
Molded polyurethanes are filled with a particular filler mixture, including a certain wollastonite or talc as a supplementary filler, to provide a polymer composition having surprising good physical properties and excellent surface quality.

Brief Summary Paragraph Right (2):
It is well known to employ various filler materials to modify the physical properties of polymeric materials. The use of such fillers is thoroughly described, for example, in Handbook of Fillers and Reinforcements for Plastics, Katz et al., eds., Van Nostrand Reinhold Company, New York, 1978. These fillers usually perform at least one of two major functions. Certain fillers (reinforcing fillers) improve certain desirable physical properties of the polymer, especially tensile strength and flexural modulus (stiffness). These reinforcing fillers typically, although not always, have an aspect ratio significantly greater than one. Examples of these include, fiber glass, milled glass, flaked glass, certain wollastonites, other high aspect ratio minerals polymeric fibers, metallic fibers, and the like. Other fillers are used simply as extenders to reduce the overall cost of the polymer composition. These extenders are typically characterized by their very low cost, and often have an aspect ratio close to one, which causes them to have minimal reinforcing properties. These include kaolin, silica, calcium carbonate, and the like.

Brief Summary Paragraph Right (6):
(A) a reinforcing filler having particles of an average aspect ratio of at least 4 and an average particle length of at least about 20 .mu., except the average particle length is at least about 40 .mu. when the reinforcing filler is wollastonite, said reinforcing filler being present in an amount which provides enhanced physical properties to the polymer composition, and

Brief Summary Paragraph Right (7):
(B) a supplementary filler comprising a wollastonite having an aspect ratio of 7 or less and a particle length of about 35 .mu. or less or an inorganic compound other than wollastonite having an average aspect ratio of about 4 or less and a median particle size of about 10 .mu.or less, in an amount sufficient to measurably improve the surface qualities of the polymer composition relative to the surface qualities of a like polymer composition not containing the supplementary filler.

Brief Summary Paragraph Right (9):
In this invention, a molded polymeric material having good surface qualities is obtained with the use of a specified combination of fillers. One of the fillers, referred to herein as a supplementary filler, is a wollastonite which has an aspect ratio of about 7 or less and a particle length of about 35 .mu. or less, or an inorganic compound other than wollastonite having an average aspect ratio of about 4 or less and a median particle size of about 10 .mu. or less, or a mixture thereof. The wollastonite preferably has an average particle length of about 1 to abut 35, more preferably about 10 to about 30 .mu.. The wollastonite also preferably has an aspect ratio (length to diameter ratio) of 1 to about 7, preferably about 3 to about 6. The wollastonite is also preferably surface treated to improve its adhesion to the bulk polymer, as described more fully hereinafter. A particularly preferred wollastonite has an aspect ratio of about 5, an average particle length of about 20-30.mu., and is surface treated with an amino-silane or epoxy-silane coupling agent. Such a wollastonite is commercially available under the trade designation

Wollastonite 400, available from Interpace Corporation.

Brief Summary Paragraph Right (10):
The other type of supplementary filler used herein is an inorganic filler having an aspect ratio of less than about 4 and an average particle size of about 10.mu. or less, preferably about 5.mu. or less, more preferably about 2.mu. or less, most preferably about 0.5 to about 2.mu.. It may or may not be surface treated as described more fully hereinafter. Among the inorganic fillers useful as the supplementary filler are talc, calcium carbonate, feldspar and nepheline syenite, with talc being highly preferred on the basis of performance. Any of the commonly available talc products are useful herein, such as Montana talc, California talc, Vermont talc, New York talc and the like, but those such as Montana talc which contain relatively low levels of impurities are preferred, as indicated by a LOI (loss on ignition) value of 10 or less, more preferably about 5 or less are preferred. Also highly preferred are talc products which have a top particle size of about 20.mu. or less, more preferably about 10.mu. or less. Exemplary such talc products include Microtalc MP 12-50, Microtalc MP 15-38, Microtalc CP 10-40, Microtalc CP 14-35, CP 20-30, all available from Pfizer Inc., MPM Division, Desertalc 57, Mikro 507, Mikro 707, all available from Johns-Manville Corp., Emtal 4190 and Emtal 15, both available from Engelhard Minerals & Chemicals Corp., Mistron Frost, Mistron Cyprubond and Mistron Vapor available from Cyprus Industrial Minerals Co., and NYTAL 400, available from R.T. Vanderbilt Company.

Brief Summary Paragraph Right (11):
The other filler (sometimes referred to herein as the "reinforcing filler") is different than the supplementary filler, and is characterized in having an aspect ratio of at least about 4, more preferably at least about 6, and an average length of at least about 20, more preferably at least about 25, most preferably at least about 40.mu.. The length of the reinforcing filler is not limited, and continuous filament fibers can be used, but preferably the filler comprises particles having a length up to about 2, more preferably up to about 0.5, most preferably up to about 0.125 inches. If wollastonite is used as the reinforcing filler, it has an average particle length of at least about 40.mu.. The reinforcing filler preferably is in the form of rod-like or plate-like particles. Suitable such reinforcing fillers include those known to be useful for improving the properties of polymers, such as, for example, wollastonite having an average particle length of at least about 40, milled glass, flaked glass, carbon black, and fibers such as fiber glass, polymeric fibers, particularly polyamide and polyester fibers, metallic fibers, ceramic fibers and the like.

Detailed Description Paragraph Table (1):
TABLE 1 _____ SAMPLE OR COMPARATIVE FILLER SAMPLE Type Amount, %.sup.1 _____ A* None -- B* Flaked Glass.sup.2 20 C* Mica.sup.3 20.5 D* Wollastonite.sup.4 23 1 Wollastonite/Talc.sup.5 23/7.5 _____ .sup.1 Based on the total weight of the polyurethane. .sup.2 A 1/64" hammer milled glass, available as 737CB from Owens Corning Corporation. .sup.3 Aphlogopite available as Suzerite 200 from Marietta Resources International, Ltd. .sup.4 Wollastonite G, available from Interpace Corporation. .sup.5 Wollastonite G (see note.sup.4) and Mistron Cyprubond, available from Cyprus Industrial Minerals Co.

CLAIMS:

1. A filled polymer composition comprising a polyurethane and/or polyurea matrix having dispersed therein a filler mixture comprising

(A) a reinforcing filler having particles of an average aspect ratio of at least 4 and an average particle length of at least about 20.mu., except the average particle length is at least about 40.mu. when the reinforcing filler is wollastonite, and

(b) a supplementary filler comprising a wollastonite having an aspect ratio of 7 or less and a particle length of about 35.mu. or less or an inorganic compound other than wollastonite having an average aspect ratio of about 4 or less and a median particle size of about 10.mu. or less wherein the composition contains from about 5 to about 50weight percent of said reinforcing filler, and about 1 to about 20 weight percent of said supplementary filler, based on the weight of the polyurethane and/or polyurea matrix.

2. The polymer composition of claim 1 wherein said reinforcing filler is selected

from the group consist of wollastonite having an ave[redacted]e particle size of at least 40.mu., milled glass, flake glass, fiber glass, and polymeric fibers, and said supplementary filler is wollastonite having an average aspect ratio of about 3 to about 6 or less and a particle length of about 10 to about 30.mu., or talc having an average particle size from about 0.5 to about 2.mu..

4. The polymer composition of claim 3 wherein the reinforcing filler is wollastonite having an average particle size of at least 40.mu. and the supplementary filler is talc.

End of Result Set

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DERWENT-WEEK: 198426
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TITLE: Fibrous moulding esp. acoustic ceiling or wall board prodn. - by foaming aq. binder system with gas, mixing with fibre, moulding and hardening

Basic Abstract Text:
The foamed aq. mixt. pref. contains 30-90 (60-75) vol.% gas (air) and 25-70% water. The amt. of fibrous material is pref. 25-95 (40-70 wt.% and the amt. of binder system 5-75 wt.% of the solids in the foamed compsn. The fibres have an average dia. of ca. 1 micromillimetre to 25 mil (max. 5 mil) and length of min. 1/64 (over 2) inch and an aspect ratio of min. 10:1. They can be organic fibres (cellulose, wood, polyester, polyolefin and/or polyamide) and/or mineral fibres (mineral wool, rock wool, slag wool, wollastonite, kaolin, glass wool and/or glass fibres). A foam generating agent (anionic, cationic and/or amphoteric type); silane coupler (up to 0.3, pref. up to 0.2, esp. up to 0.1%); polyethylene oxide (up to 0.5, pref. up to 0.3, esp. up to 0.1 wt.%; a thickener (0.1-0.5 wt.% methylcellulose and/or hydroxypropylcellulose, giving an aq. soln. with a viscosity of over 1500 cP); a dispersant (up to 1% Na hexametaphosphate); a (nonionic) foam stabiliser (up to 1.0, pref. up to 0.7%); dyestuffs, pigments, antioxidants, water-repellents, fillers, fire retardants and/or mixts. of these can be incorporated. The binder can be an organic material, pref. starch, modified (oxidised, ethoxylated) starch and/or latex (PVA, PVA/acrylic copolymers or styrene-butadiene polymers) in an amt. of 5-50 (10-35) wt.% and may contain a binding filler (clay and/or gypsum in an amt. of up to 40, pref. up to 30, esp. up to 20% clay or up to 20, pref. up to 15, esp. up to 10% gypsum).

Basic Abstract Text (2):
The foamed aq. mixt. pref. contains 30-90 (60-75) vol.% gas (air) and 25-70% water. The amt. of fibrous material is pref. 25-95 (40-70 wt.% and the amt. of binder system 5-75 wt.% of the solids in the foamed compsn. The fibres have an average dia. of ca. 1 micromillimetre to 25 mil (max. 5 mil) and length of min. 1/64 (over 2) inch and an aspect ratio of min. 10:1. They can be organic fibres (cellulose, wood, polyester, polyolefin and/or polyamide) and/or mineral fibres (mineral wool, rock wool, slag wool, wollastonite, kaolin, glass wool and/or glass fibres). A foam generating agent (anionic, cationic and/or amphoteric type); silane coupler (up to 0.3, pref. up to 0.2, esp. up to 0.1%); polyethylene oxide (up to 0.5, pref. up to 0.3, esp. up to 0.1 wt.%; a thickener (0.1-0.5 wt.% methylcellulose and/or hydroxypropylcellulose, giving an aq. soln. with a viscosity of over 1500 cP); a dispersant (up to 1% Na hexametaphosphate); a (nonionic) foam stabiliser (up to 1.0, pref. up to 0.7%); dyestuffs, pigments, antioxidants, water-repellents, fillers, fire retardants and/or mixts. of these can be incorporated. The binder can be an organic material, pref. starch, modified (oxidised, ethoxylated) starch and/or latex (PVA, PVA/acrylic copolymers or styrene-butadiene polymers) in an amt. of 5-50 (10-35) wt.% and may contain a binding filler (clay and/or gypsum in an amt. of up to 40, pref. up to 30, esp. up to 20% clay or up to 20, pref. up to 15, esp. up to 10% gypsum).